

Project: **Waste Sorting Plant**

Title:

APPENDIX A 4

PERFORMANCE GUARANTEES

WASHING PLANT

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1 GENERAL

During the Trial Run (see Appendix A5), following commissioning of the washing line various performance tests shall be carried out.

The Tenderer has to fill in those values which he commits to attain during such tests in the columns as defined. The given guarantees shall be verified during the 3 weeks performance and functional test period.

2 CAPACITY

		Client's requirement	Value guaranteed by Contractor
Capacity of the plant 1 shift; 250 workdays/year 8h/d incl. cleaning without maintenance			
<u>Film washing line (40µm)</u>	t input/year	3.300	confirmed
<u>HDPE/PP washing line</u>	t input/year	2.500	confirmed
Hourly capacity of the plant (*)			
<u>Film washing line (ca. 40 µm)</u>			
minimum hourly capacity each week during 3 weeks test. Average per week	t input/h	>2,0	2 x 1000 kg/h
Output capacity, average per week	t/h	>1,5	2 x 750 kg/h
<u>Film washing line (ca. 25 µm)</u>			
minimum hourly capacity each week during 3 weeks test. Average per week	t input/h	>2,0	2 x 660 kg/h
Output capacity, average per week	t/h	>1,5	2 x 500 kg/h
<u>HDPE/PP washing line)</u>			
minimum hourly capacity each week during 3 weeks test. Average per week	t/h	>1,5	2 x 2500 kg/h
Output capacity, average per week	t/h	>1,1	2 x 2000 kg/h
<u>Extruder plant</u>			
minimum hourly capacity each week during 3 weeks test. Average per week LDPE	t/h	>1,5	confirmed

(*) Before the line availability values declared at next Pos. 3



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3 AVAILABILITY

		Client's requirement	Value guaranteed by Contractor
Availability 1 shift; 250 workdays/year 8h/d incl. cleaning without maintenance (*)			
<u>Film washing line</u> (measured during 3 week performance tests)	%	≥ 85	≥ 90
<u>HDPE/PP washing line</u> (measured during 3 week performance tests)	%	≥ 85	≥ 90
<u>Extruder plant</u> (measured during 3 week performance tests)	%	≥ 85	≥ 90
<u>Water treatment plant</u> (measured during trial run)	%	≥ 95	confirmed

(*) Both for ordinary and for extraordinary maintenance

4 OTHER OPERATIONAL GUARANTIES

		Client's requirement	Value guaranteed by Contractor
<u>Washing plant</u>			
Absorbed electrical power, PE film	kWh/kg product		0,86
Absorbed electrical power, HDPE	kWh/kg product		0,30
Absorbed electrical power, PP	kWh/kg product		0,30
Fresh water consumption; PE film	l/kg product		2,5
Fresh water consumption; HDPE/PP	l/kg product		2,5
Total wastewater, both lines output. Max.	l/h		7.500 - PE film 10.000 - rigid
Total wastewater, both lines output	l/day (24 h)		180.000- PE film 240.000 - rigid
<u>Extruder</u>			
Absorbed electrical power	kWh/kg product		0,28
Absorbed electrical power stand-by	kWh		60
Cooling water consumption, max	l/h		30.000 (#)
Cooling water consumption	l/day (8 h)		200 (=)
Ventilation system/degassing	m³/h		400

(#) through chiller (closed loop circuit) - cooling capacity 500.000 kcal/h
(=) just evaporation

5 PURITY OF WASHED MATERIALS

m% = mass-%

		Client's requirement	Value guaranteed by Contractor
Film washing line:			
Size:	mm	3-12	1+12
Moisture	m%	< 4	confirmed
Bulk density	kg/m ³		~ 30
Contaminations:			
PVC	ppm	≤ 10	50
PET	ppm	≤ 10	50 (from PET bottle)
Paper	ppm	≤ 50	500
Glue	ppm	≤ 100	100
Metals	ppm	≤ 10	10
Inorganic	ppm	≤ 10	50
Dust (<0,5mm)	m%	<0,5	0,5
Residual pH		neutral (6,5-7,5)	confirmed (#)

(#) Demineralized water test

		Client's requirement	Value guaranteed by Contractor
HDPE/PP washing line			
Size:	mm	3-12 <3mm <2% >12mm <1%	1-12 <3mm <5% >12mm <1%
Moisture after mechanic. dryer	m%	< 1,5%	5%
Moisture flake	m%	< 0,1%	0,7%
Bulk density HDPE	kg/m ³	≥ 350	250+300
Bulk density PP	kg/m ³	≥ 300	200+250
Contaminations:			
PVC	ppm	≤ 10	50
PET	ppm	≤ 10	50 (from PET bottle)
Paper	ppm	≤ 50	50
Glue	ppm	≤ 100	1500 (*)
Metals	ppm	≤ 10	10
Inorganic	ppm	≤ 10	50
Dust (<0,5mm)	m%	<0,5%	0,5
Residual pH		neutral (6,5-7,5)	confirmed (#)



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(*) liquid soap & detergent boxes with labels glued on 100% of the surface

		Client's requirement	Value guaranteed by Contractor
Extruder line			
Moisture, surface (T 105°C)	m%	0,1	confirmed
Moisture, innen (K-F-Titration)	m%	0,1	confirmed
Melt filtration	µm	75	(*)

6 INDIVIDUAL EQUIPMENT

		Client's requirement	Value guaranteed by Contractor
Individual equipment			
Shredder			
Capacity PE Film	t input/hour	≥ 2	4000 kg/h
Size after shredder <80mm	m%	≥ 98	confirmed
Capacity HDPE/PP	t input/hour	≥ 2	5000 kg/h
Size after shredder <80mm	m%	≥ 98	confirmed

(*) 110 µm (mesh 24-110) for PE film
200 µm (mesh 13-90) for rigid



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7 WASTE WATER

		Client's requirement	Value guaranteed by Contractor
Waste water after cleaning plant (treatment plant)			
BOD ₅		Must be given	(*)
SS	mg/l	<350	confirmed
Sinking solids (>10mm)	mg/l	0	confirmed
Chlorides	mg/l	<1000	confirmed
Oil	mg/l	<20	confirmed (#)
Fat	mg/l	<200	confirmed (#)
pH		6-9	confirmed
Heavy Metals			
Pb	mg/l	<0,05	confirmed
Cd	mg/l	<0,002	confirmed
Cu	mg/l	<0,2	confirmed
Cr-tot	mg/l	<0,05	confirmed
Hg	mg/l	<0,002	confirmed
Ni	mg/l	<0,05	confirmed
Zn	mg/l	<0,5	confirmed
Detergents and disinfectants	PEC/PNEC	<1	confirmed (#)
Temperature	°C	<30	confirmed

(*) 250 mg/l - PE film
500-800 mg/l - film

(#) Valid only for PE film.
Values for rigid to be evaluated depending on the relevant contamination of the input bottles and considering that the water treatment include the physical and chemical step but not the biological.



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